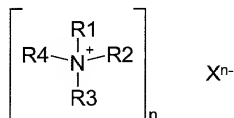


## Claims

1. A composition for storing heat, comprising at least one heat storage material and at least one auxiliary for aiding heat transmission, wherein at least one of the at least one heat storage material has at least one solid/solid phase transition and is solid throughout the application range.
2. A composition for storing heat according to Claim 1, wherein one heat storage material comprises a compound conforming to the empirical formula



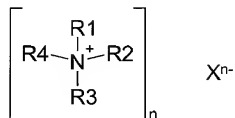
wherein R1, R2, R3 and R4 are each, independently, a radical H, C<sub>1</sub>-C<sub>30</sub> alkyl or C<sub>1</sub>-C<sub>30</sub> hydroxyalkyl, and X<sup>n-</sup> is a monoatomic or complex inorganic anion, where n results from the ionic charge of the anion.

3. A composition for storing heat according to claim 1, wherein one heat storage material comprises a compound wherein its low-temperature form crystallizes in a sheetlike perovskite type.
4. A composition for storing heat according to Claim 2, wherein one heat storage material comprises a dialkylammonium salt.
5. A composition for storing heat according to Claim 2, wherein one heat storage material comprises mixed crystals of different dialkylammonium salts.
6. A composition for storing heat according to Claim 2, wherein one heat storage material comprises diethylammonium chloride, dipropylammonium chloride, dibutylammonium chloride, dipentylammonium chloride, dihexylammonium chloride, dioctylammonium chloride, didecylammonium chloride, didodecylammonium chloride, dioctadecylammonium chloride,

- diethylammonium bromide, dipropylammonium bromide, dibutylammonium bromide, dipentylammonium bromide, dihexylammonium bromide, dioctylammonium bromide, didecylammonium bromide, didodecylammonium bromide, dioctadecylammonium bromide, diethylammonium nitrate, dipropylammonium nitrate, dibutylammonium nitrate, dipentylammonium nitrate, dihexylammonium nitrate, dioctylammonium nitrate, didecylammonium nitrate, diundecylammonium nitrate, didodecylammonium nitrate, dioctylammonium chlorate, dioctylammonium acetate, dioctylammonium formate, didecylammonium chlorate, didecylammonium acetate, didecylammonium formate, didodecylammonium chlorate, didodecylammonium formate, didodecylammonium hydrogensulfate, didodecylammonium propionate, or dibutylammonium-2-nitrobenzoate.
7. A composition for storing heat according to Claim 1, wherein the heat storage material has an average crystallite size of about 0.1 to about 1000  $\mu\text{m}$ , and the material is insoluble in water.
8. A composition for storing heat according to Claim 1, wherein the application range of the heat storage material has a solid/solid phase transition which has an enthalpy of at least about 50 J/g.
9. A composition for storing heat according to Claim 1, wherein the application range of the heat storage material has a solid/solid phase transition which lies within the temperature range of about  $-100^{\circ}\text{C}$  – about  $150^{\circ}\text{C}$ .
10. A composition for storing heat according to Claim 1, wherein the at least one auxiliary comprises a substance or preparation having good thermal conductivity in the form of a loose bed or in the form of shaped bodies.
11. A composition for storing heat according to Claim 10, wherein the auxiliary comprises paraffin.

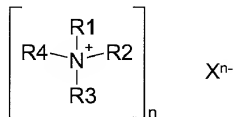
12. A composition for storing heat according to Claim 1, wherein the at least one auxiliary comprises a binder finely distributed with the crystallites of the heat storage material.
- 5 13. A composition for storing heat according to Claim 12, wherein the composition is in the form of fibers, with the binder serving simultaneously as fiber base material.
- 10 14. A composition for storing heat according to Claim 12, wherein the composition is in the form of fibers, with a natural or synthetic fiber forming the basic structure of the fiber and the binder or binders together with the heat storage material forming a coating around this fiber.
- 15 15. A composition for storing heat according to Claim 12, wherein the composition is in the form of a coating on a surface or around a textile fabric.
16. A composition for storing heat according to Claims 12, wherein the polymeric binder is a curable polymer or polymer precursor polyurethane, a nitrile rubber, chloroprene, polyvinyl chloride, a silicone, an ethylene-vinyl acetate  
20 copolymer or a polyacrylate.
17. A composition for storing heat according to Claim 1, wherein the composition is present in the form of an open-celled or closed-celled foam, with the auxiliary.  
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18. A composition for storing heat according to Claim 12, wherein the binder comprises an inorganic binder comprising a water-insoluble silicate, a phosphate, a sulfate or a metal oxide.
- 30 19. A storage media for a latent heat storage system comprising a compound having at least one solid/solid phase transition.

20. A storage media according to Claim 19 wherein the compound has the formula:



- 5 wherein R1, R2, R3 and R4 are each, independently of one another, a radical H, C<sub>1</sub>-C<sub>30</sub> alkyl or C<sub>1</sub>-C<sub>30</sub> hydroxyalkyl and X<sup>n-</sup> is a monoatomic or a complex inorganic anion, wherein n results from the ionic charge of the anion.

21. A thermostating process comprising storing heat in a compound of the formula:



- 10 wherein R1, R2, R3 and R4 are each, independently of one another, a radical H, C<sub>1</sub>-C<sub>30</sub> alkyl or C<sub>1</sub>-C<sub>30</sub> hydroxyalkyl and X<sup>n-</sup> is a monoatomic or a complex inorganic anion, wherein n results from the ionic charge of the anion.

- 15 22. A foam comprising a composition according to Claim 17 for imparting thermostatic properties to clothing.

23. A device for cooling an electronic component comprising a composition according to Claim 10.

- 20 24. A building comprising a composition according to Claim 18 for the thermostating.

- 25 25. A composition according to Claim 2 wherein X<sup>n-</sup> is fluoride, chloride, bromide, iodide, nitrate, chlorate, perchlorate, sulfate, phosphate, tetrachlorochromate, tetrachloromanganate, tetrachlorocadmate, tetrachloropalladate,

tetrachloroferrate, formate, acetate, propionate, butyrate, caprate, stearate, palmitate, acrylate, oleate, oxalate, malonate, succinate, glutarate, benzoate, 2-nitrobenzoate, salicylate or phenyl-acetate.

5 26. A composition according to Claim 3 wherein the compound is a monoalkylammonium tetrachlorochromate, a monoalkylammonium tetrachloromanganate, a monoalkylammonium tetrachlorocadmate, a monoalkylammonium tetrachloropalladate, or a monoalkylammonium tetrachloroferrate having an alkyl chain length of C<sub>1</sub>-C<sub>30</sub>.

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27. A composition according to Claim 4 wherein R1 and R2 have identical carbon chain lengths and R3 and R4 are hydrogen.

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28. A composition according to Claim 6 wherein the one heat storage material comprises dioctylammonium chloride, didecylammonium chloride, didodecylammonium chloride, dioctadecylammonium chloride, dihexylammonium bromide, didecylammonium bromide, didodecylammonium bromide, dioctadecylammonium bromide, dihexylammonium nitrate, dioctylammonium nitrate, didecylammonium nitrate, dioctylammonium chlorate, dioctylammonium acetate, dioctylammonium formate, didecylammonium chlorate, didecylammonium acetate, didecylammonium formate, didodecylammonium chlorate, didodecylammonium formate, didodecylammonium hydrogensulfate, didodecylammonium propionate, dibutylammonium-2-nitrobenzoate, or didodecylammonium nitrate.

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29. A composition according to Claim 10 where the auxiliary comprises a metal powder or a metal granule or graphite, wherein the heat storage material is mixed with the auxiliary.

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30. A composition according to Claim 12 wherein the polymeric binder is a polyurethane, a nitrile rubber, chloroprene, polyvinyl chloride, a silicone, an ethylene-vinyl acetate copolymer or a polyacrylate.

31. A composition according to Claim 2, wherein  $X^{n-}$  is an organic ion.